

Serial No.: 10/776,106
Amdt. dated 04 December 2007
Reply to Office Action of 02 November 2007

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Amendments to the Claims:

This listing will replace all previous listings and versions of the claims in the application:

Listing of claims:

1. (Currently Amended) A laser system for destroying bacteria in a bacterial locale, said system comprising:

- (a) a housing and a control system;
- (b) a laser oscillator sub-system within said housing for causing the selective emission, under control of said control system, of first radiation in a first wavelength range of 865 nm to 875 nm[[,]] and ~~the selective emission under said control of~~ second radiation [[at]] in a second wavelength range of 925 nm to 935 nm;
- (c) an optical channel for transmission of said first radiation and said second radiation from said laser oscillator sub-system; and
- (d) a head for enabling delivery of said first radiation and said second radiation from said laser oscillator sub-system through said optical channel to the site of said bacterial locale;
- (e) wherein said first radiation and said second radiation are suitable being adapted to activate a chromophore ~~from~~ at said bacterial locale and ~~being adapted to cooperate with said chromophore~~ to destroy bacteria in said bacterial locale.

2. (Currently amended) The laser system of claim 1 wherein the optical channel comprises two optical channels and said transmission is simultaneous along the two optical channels.

3. (Original) The laser system of claim 1 wherein said transmission is alternate.

4. (Original) The laser system of claim 1 wherein said transmission is multiplexed.

Serial No.: 10/776,106
Amdt. dated 04 December 2007
Reply to Office Action of 02 November 2007

5. (Currently Amended) The laser system of claim 1 wherein said head includes ~~an optical egress for said first radiation and said second radiation, and~~ a scaling instrument.

6. (Currently Amended) The laser system of claim 1 wherein said head includes ~~an optical egress having a frosted tip.~~

7. (Currently Amended) The laser system of claim 1 wherein said head includes ~~an optical egress and an otoscope.~~

8. (Currently Amended) The laser system of claim 1 wherein said head includes a digit clip ~~and an optical egress therefrom.~~

9. (Canceled)

10. (Currently Amended) The laser system of claim 1 wherein said head includes a handle ~~and an optical egress extending therefrom.~~

11. (Currently Amended) A laser system for destroying bacteria in a bacterial locale, said system comprising:

(a) a housing and a control system;

(b) a laser oscillator sub-system within said housing for causing the selective emission, under control of said control system, of first radiation ~~narrowly~~ at a first wavelength of substantially 870 nm and ~~the selective emission under said control of~~ second radiation at a second wavelength of substantially 930 nm;

(c) a head for delivering said first radiation and said second radiation from said laser oscillator sub-system to the site of said bacterial locale; and

(d) wherein said first radiation and said second radiation ~~being adapted are~~ suitable to activate a chromophore ~~from at~~ said bacterial locale ~~and being adapted to cooperate with said chromophore~~ to destroy bacteria in said bacterial locale.

Serial No.: 10/776,106
Amdt. dated 04 December 2007
Reply to Office Action of 02 November 2007

12. (Currently Amended) The laser system of claim 11 wherein the optical channel comprises two optical channels and said transmission is simultaneous along the two optical channels.

13. (Original) The laser system of claim 11 wherein said transmission is alternate.

14. (Original) The laser system of claim 11 wherein said transmission is multiplexed.

15. (Currently Amended) The laser system of claim 11 wherein said head includes ~~an optical egress for said first radiation and said second radiation,~~ and a scaling instrument.

16. (Original) The laser system of claim 11 wherein said head includes an optical egress having a frosted tip for insertion into a root canal.

17. (Currently Amended) The laser system of claim 11 wherein said head includes ~~an optical egress and~~ an otoscope.

18. (Currently Amended) The laser system of claim 11 wherein said head includes a digit clip ~~and an optical egress therefrom.~~

19. (Canceled)

20. (Currently Amended) The laser system of claim 11 wherein said head includes a handle ~~and an optical egress extending therefrom.~~

21. (Withdrawn – Currently Amended) A process for destroying bacteria in a bacterial locale, said process comprising:

(a) energizing a laser to cause the selective emission of first radiation in a first wavelength range of 865 nm to 875 nm and the selective emission of second radiation ~~[[at]]~~ in a second wavelength range of 925 nm to 935 nm;

(b) establishing a path for the transmission of said first radiation and said second radiation from said laser oscillator sub-system; and

Serial No.: 10/776,106
Amdt. dated 04 December 2007
Reply to Office Action of 02 November 2007

- (c) enabling delivery of said first radiation and said second radiation from said laser oscillator sub-system through said optical channel to the site of said bacterial locale;
- (d) said first radiation and said second radiation activating a chromophore from said bacterial locale and cooperating with said chromophore to destroy bacteria in said bacterial locale.

22. (Withdrawn – Currently Amended) A process for destroying bacteria in a bacterial locale, said process comprising:

- (a) energizing a laser to cause the selective emission of first radiation ~~in the having a selected wavelength of 870nm and the selective emission of second radiation in the selective~~ having a wavelength range of 930nm;
- (b) establishing a path for the transmission of said first radiation and said second radiation from said laser oscillator sub-system; and
- (c) enabling delivery of said first radiation and said second radiation from said laser oscillator sub-system through said optical channel to the site of said bacterial locale;
- (d) said first radiation and said second radiation activating a chromophore from said bacterial locale and cooperating with said chromophore to cause a reaction with bacteria in said bacterial locale.

23. (Withdrawn) The process of claim wherein said bacteria is E. coli.

24. (Withdrawn) The process of claim wherein said reaction is a toxic singlet oxygen reaction.

25. (Withdrawn) A laser process comprising destroying bacteria in an infected locale by a reaction resulting from application to said infected locale of laser radiation, which is primarily of two wavelength ranges that are generated by a laser system:

- (a) said bacteria including E. coli;

Serial No.: 10/776,106
Amdt. dated 04 December 2007
Reply to Office Action of 02 November 2007

- (b) said system comprising:
 - (1) a housing and a control;
 - (2) a laser oscillator sub-system within said housing for causing the selective emission under said control of first radiation that is primarily in a first wavelength range of 865 nm to 875 nm, and the selective emission under said control of second radiation at a second wavelength range that is primarily in a wavelength range of 925 nm to 935 nm;
 - (3) an optical channel for transmission of said first radiation and said second radiation from said laser oscillator sub-system; and
 - (4) a head for enabling delivery of said first radiation and said second radiation from said laser oscillator sub-system through said optical channel to the site of said bacterial locale;
 - (5) said first radiation and said second radiation activating a chromophore from said bacterial locale and cooperating with said chromophore to destroy said bacteria in said bacterial locale.

26. (Withdrawn) A laser process comprising destroying bacteria in an infected locale by a reaction resulting from application to said infected locale of laser radiation, which is primarily of two wavelength ranges that are generated by a laser system, said system comprising:

- (a) a housing and a control;
- (b) a laser oscillator sub-system within said housing for causing the selective emission under said control of first radiation that is primarily in a first wavelength range of 865 nm to 875 nm, and the selective emission under said control of second radiation at a second wavelength range that is primarily in a wavelength range of 925 nm to 935 nm;
- (c) an optical channel for transmission of said first radiation and said second radiation from said laser oscillator sub-system; and

Serial No.: 10/776,106
Amdt. dated 04 December 2007
Reply to Office Action of 02 November 2007

(d) a head for enabling delivery of said first radiation and said second radiation from said laser oscillator sub-system through said optical channel to the site of said bacterial locale;

(e) said first radiation and said second radiation activating a chromophore from said bacterial locale and cooperating with said chromophore to destroy said bacteria in said bacterial locale;

(f) said reaction being a toxic singlet oxygen reaction.

27. (Withdrawn) A dental process comprising scaling an infected locale and destroying bacteria in said infected locale by a reaction resulting from application to said infected locale of laser radiation, which is primarily of two wavelength ranges that are generated by a laser system, said system comprising:

(a) a housing and a control, said system comprising a head that includes a dental scaler and an optical egress in close proximity;

(b) a laser oscillator sub-system within said housing for causing the selective emission under said control of first radiation that is primarily in a first wavelength range of 865 nm to 875 nm, and the selective emission under said control of second radiation at a second wavelength range that is primarily in a wavelength range of 925 nm to 935 nm;

(c) an optical channel for transmission of said first radiation and said second radiation from said laser oscillator sub-system;

(d) said head enabling delivery of said first radiation and said second radiation from said laser oscillator sub-system through said optical channel to the site of said bacterial locale;

(e) said first radiation and said second radiation activating a chromophore from said bacterial locale and cooperating with said chromophore to destroy said bacteria in said bacterial locale; and

Serial No.: 10/776,106
Amdt. dated 04 December 2007
Reply to Office Action of 02 November 2007

(f) said reaction being a toxic singlet oxygen reaction.

28. (Withdrawn) A dental process comprising:

(a) inserting a mechanical probe into an infected root canal to expose said root canal;

(b) removing said mechanical probe from said infected root canal;

(c) inserting an optical probe into said infected root canal to cause a reaction in bacteria in said infected root canal by transmission of laser radiation from said optical probe to bacteria in said infected root canal;

(d) said laser radiation consisting essentially of one or both of a first radiation and a second radiation, said first radiation being primarily in a first wavelength range of 865 nm to 875 nm, and said second radiation being primarily in a second wavelength range of 925 nm to 935 nm;

(e) said first radiation and/or said second radiation activating a chromophore in said bacterial locale and cooperating with said chromophore to destroy said bacteria;

(f) said reaction being a toxic singlet oxygen reaction;

(g) removing said optical probe from said root canal; and

(h) filling said root canal with a dental prosthesis.

29. (Withdrawn) The process of claim 28 wherein said bacteria is E. coli.

30. (Withdrawn) A therapeutic process comprising:

(a) inserting a diseased digital member into a clip having a pair of opposed elements;

(b) said opposed elements having optical egresses in communication with

Serial No.: 10/776,106
Amdt. dated 04 December 2007
Reply to Office Action of 02 November 2007

opposed sections of said digital member;

(c) causing a reaction in bacteria in said diseased digital member by transmission of laser radiation from said optical egresses to said bacteria;

(d) said laser radiation consisting essentially of one or both of a first radiation and a second radiation, said first radiation being primarily in a first wavelength range of 865 nm to 875 nm, and said second radiation being primarily in a second wavelength range of 925 nm to 935 nm;

(e) said first radiation and/or said second radiation activating a chromophore in said bacteria and cooperating with said chromophore to destroy said bacteria;

(f) said reaction being a toxic singlet oxygen reaction.

31. (Withdrawn) The process of claim 30 wherein said bacteria is E. coli.

32. (Withdrawn) A therapeutic process comprising:

(a) inserting an otoscope into an infected ear canal;

(b) said otoscope having an optical egress in communication with said ear canal;

(c) causing a reaction in bacteria in said infected ear canal by transmission of laser radiation from said optical egress to said bacteria;

(d) said laser radiation consisting essentially of one or both of a first radiation and a second radiation, said first radiation being primarily in a first wavelength range of 865 nm to 875 nm, and said second radiation being primarily in a second wavelength range of 925 nm to 935 nm;

(e) said first radiation and/or said second radiation activating a chromophore in said bacteria and cooperating with said chromophore to destroy said bacteria;

Serial No.: 10/776,106
Amdt. dated 04 December 2007
Reply to Office Action of 02 November 2007

(f) said reaction being a toxic singlet oxygen reaction.

33. (Withdrawn) A therapeutic process comprising:

(a) subjecting a diseased anatomical local to laser radiation;

(b) causing a reaction in bacteria in said diseased locale by transmission of laser radiation to said bacteria;

(c) said laser radiation consisting essentially of one or both of a first radiation and a second radiation, said first radiation being primarily in a first wavelength range of 865 nm to 875 nm, and said second radiation being primarily in a second wavelength range of 925 nm to 935 nm;

(d) said first radiation and/or said second radiation activating a chromophore in said bacteria and cooperating with said chromophore to destroy said bacteria;

(e) said reaction being a toxic singlet oxygen reaction.

34. (Currently Amended) A laser system for therapeutic treatment of bacteria in an infected site with non-ionizing optical energy and without detrimental heat deposition or irreversible harm to a biological system including the infected site, the system comprising:

(a) a laser oscillator system configured and arranged to selectively emit near infrared radiation at a power density in one or both of a first wavelength range of about 865 nm to about 875 nm and a second wavelength range of about 925 nm to about 935 nm;

(b) a control connected to the laser oscillator system, the control configured and arranged to control the selective emission of near infrared energy at the power density from the laser oscillator system for absorption as non-ionizing optical energy without detrimental heat deposition or irreversible harm to the biological system at the infected site;

(c) an optical channel connected to the laser oscillator system, the optical channel configured and arranged for transmission of the near infrared radiation; and

Serial No.: 10/776,106
Amdt. dated 04 December 2007
Reply to Office Action of 02 November 2007

(d) a head configured and arranged to deliver the near infrared energy from the laser oscillator system and the optical channel to bacteria in the infected site at the power density for absorption as ~~non-ionizing optical energy without detrimental heat deposition or irreversible harm to the biological system~~ at the infected site.

35. (Previously Presented) The system of claim 34, wherein the control is configured and arranged to adjust the power density of the emitted near infrared energy, forming an adjusted power density, wherein the adjusted power density comprises a necessary bactericidal density at the infected site.

36. (Canceled)

37. (Previously Presented) The system of claim 34, further comprising a housing configured and arranged to hold the laser oscillator system.

38.-42. (Canceled)